

## ABSTRACT OF THE DISCLOSURE

Three or four-dimensional ultrasound data acquisition for extended field of view imaging is provided. Multiple volumes are registered with respect to each other and spliced together to form an extended volume. The extended volume is a contiguous volume larger than a volumetric region that a multi-dimensional or wobbler transducer array is capable of imaging without movement. Information representing different volumes is registered with respect to each other by sensing the transducer position associated with each of the different volumes. The position is sensed using a position sensing mechanism, such as magnetic optical or gyroscope measurements. Acoustic data may be used to determine decorrelation of speckle or correlation of features to sense position. After the volumes are registered, any overlapping regions are compounded. The resulting extended field of view volume is displayed and manipulated for viewing by the user. A large volume or extended volume of the patient is used for assessing an organ, such as an entire fetus in OB applications.